

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Yamamoto, et al.

Serial No.: Not Yet Assigned

Examiner: Not Yet Assigned

Filed: Herewith

Group Art Unit: Not Yet Assigned

For: HIGH POLYMER GEL AND ACTIVATION METHOD FOR COMPOUNDS
CONTAINING ACTIVE HYDROGEN

Assistant Commissioner for Patents
Washington, D.C. 20231

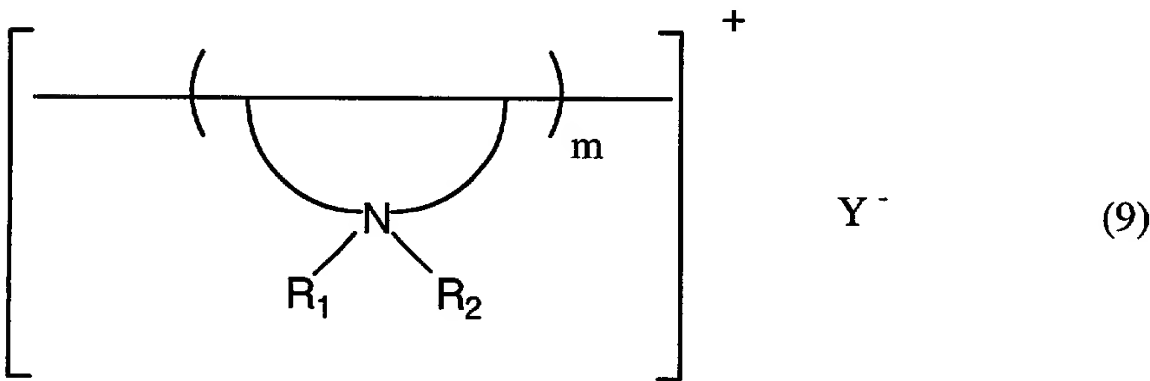
Dear Sir:

PRELIMINARY AMENDMENT

Please amend the above-identified application, being filed herewith, as follows:

IN THE SPECIFICATION:

On page 21, rewrite formula (9) as



On page 95, rewrite the second paragraph as

A hydroxyethylation reaction of acrylic acid was carried out by using the polymer gel that had been formed by allowing the polymer (6) obtained in Embodiment 6 to swell in the

reaction solution as a catalyst through the same reactions and operations as those of Embodiment 28 except that the polymer (6) obtained in Embodiment 6 was used instead of the grainy resin (5) obtained in Embodiment 5.

IN THE CLAIMS:

Please cancel, without prejudice or disclaimer, claims 1-13.

Kindly add the following new claims.

14. (new) An method for addition of a heterocyclic compound or an aldehyde to an active-hydrogen-containing compound, comprising the steps of

activating an active-hydrogen-containing compound with a polymer gel having a cyclic amine structure or a cyclic quaternary ammonium salt structure in the presence of a heterocyclic compound or an aldehyde under conditions conducive to the addition of the heterocyclic compound or the aldehyde to the active-hydrogen-containing compound.

15. (new) The addition method of claim 14, wherein:

the active-hydrogen-containing compound is a compound selected from the group consisting of phenols, amides, alcohols, and carboxylic acids; and

the heterocyclic compound is an oxirane compound.

16. (new) The addition method of claim 14, wherein the polymer gel has a three-dimensional network structure holding solvent inside thereof and also has active sites for activating the active-hydrogen-containing compound inside the three-dimensional network structure and/or on the surface thereof.

17. (new) The addition method of claim 14, wherein the cyclic amine structure or the cyclic quaternary ammonium salt structure in the polymer gel is derived from at least one

selected from the group consisting of *N,N,N*-triallylamines, *N,N*-diallylamines, and diallyldimethylammonium chlorides.

18. (new) The addition method of claim 14, wherein the polymer gel has a ratio of swell of not less than 2.

19. (new) The addition method of claim 14, wherein the polymer gel has a thermal decomposition temperature, that is, a heat-absorption peak temperature on a TG-DTA curve obtained when the polymer gel is heated at a rate of 5°C/min in a nitrogen gas flow, of not less than 300 °C.

20. (new) A method for manufacturing a hydroxyalkyl(meth)acrylate comprising the step of

activating (meth)acrylate with a polymer gel having a cyclic amine structure or a cyclic quaternary ammonium salt structure in the presence of an oxirane under conditions conducive to the addition of the oxirane to the (meth)acrylate to form a hydroxyalkyl(meth)acrylate.

REMARKS

The paragraph entitled "CROSS-REFERENCE TO RELATED APPLICATIONS" has been added by way of the divisional application transmittal filed herewith.

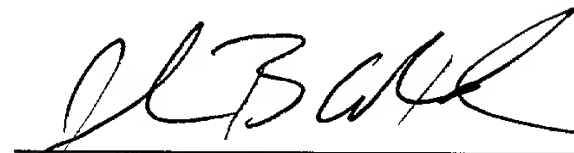
Claims 1-13 have been cancelled without prejudice or disclaimer and claims 14-20 have been added. No new matter has been added by virtue of these amendments. Support for the new claims can be found through out the specification and claims as originally filed. For example, see page 7, line 23 to page 8, line 25; page 35, line 1 to page 49, line 22; and page 21, formula (9); page 49, lines 2-22; page 24, line 3 from the bottom to page 25, line 2; page 30, line 22 to page 31, line 17; page 29, line 11 to page 30, line 4; page 56, lines 12-25; page 49 lines 2-22; page 47, line 4 to line 2 from the bottom of the page; and claims 2, 9, 10 and 13 as originally filed.

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Early consideration and allowance are respectfully requested.

Respectfully submitted,

Date: July 27, 2001



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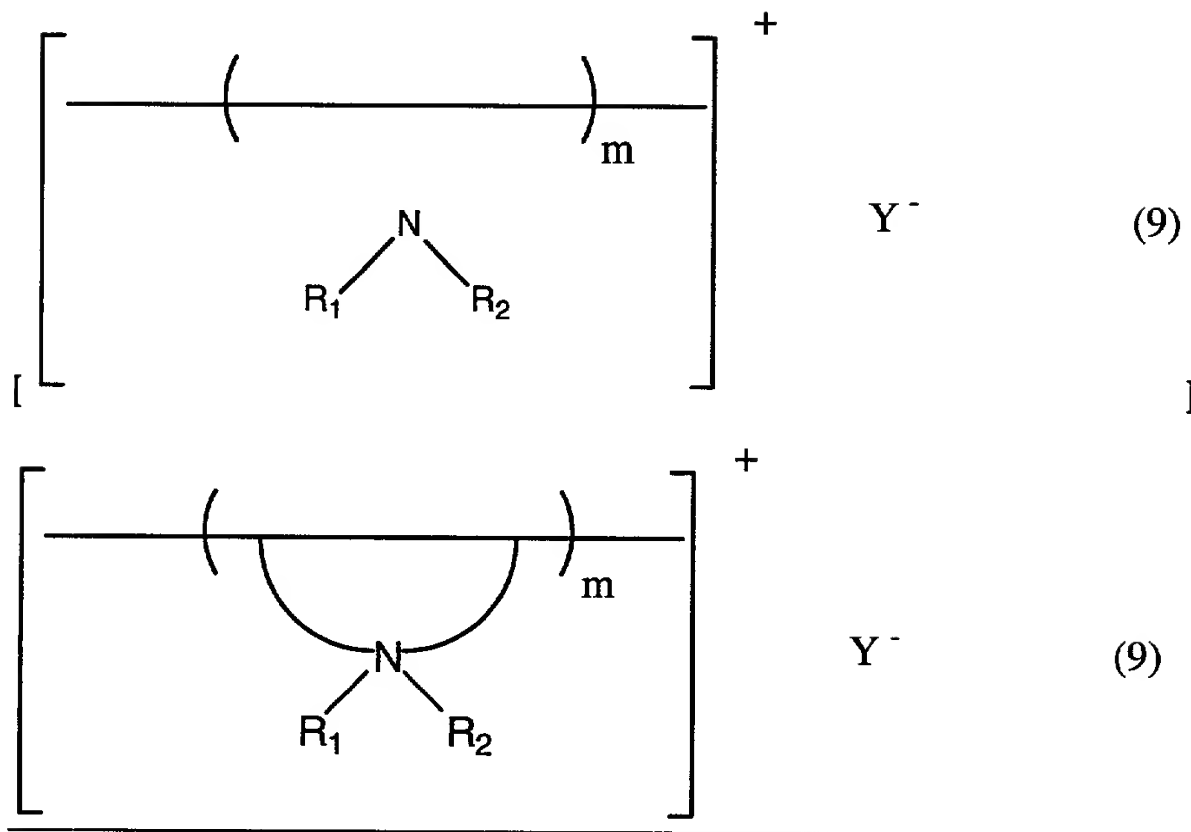
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APPENDIX

IN THE SPECIFICATION

On page 21, rewrite formula (9) as



On page 95, rewrite the second paragraph as

A hydroxyethylation reaction of acrylic acid was carried out by using the polymer gel that had been formed by allowing the polymer (6) obtained in Embodiment 6 to swell in the reaction solution as a catalyst through the same reactions and operations as those of Embodiment 28 except that the polymer (6) [grainy resin (5)] obtained in Embodiment 6 was used instead of the grainy resin (5) obtained in Embodiment 5.

IN THE CLAIMS

14. (new) An method for addition of a heterocyclic compound or an aldehyde to an active-hydrogen-containing compound, comprising the steps of

activating an active-hydrogen-containing compound with a polymer gel having a cyclic amine structure or a cyclic quaternary ammonium salt structure in the presence of a heterocyclic compound or an aldehyde under conditions conducive to the addition of the heterocyclic compound or the aldehyde to the active-hydrogen-containing compound.

15. (new) The addition method of claim 14, wherein:
the active-hydrogen-containing compound is a compound selected from the group consisting of phenols, amides, alcohols, and carboxylic acids; and
the heterocyclic compound is an oxirane compound.

16. (new) The addition method of claim 14, wherein the polymer gel has a three-dimensional network structure holding solvent inside thereof and also has active sites for activating the active-hydrogen-containing compound inside the three-dimensional network structure and/or on the surface thereof.

17. (new) The addition method of claim 14, wherein the cyclic amine structure or the cyclic quaternary ammonium salt structure in the polymer gel is derived from at least one selected from the group consisting of *N,N,N*-triallylamines, *N,N*-diallylamines, and diallyldimethylammonium chlorides.

18. (new) The addition method of claim 14, wherein the polymer gel has a ratio of swell of not less than 2.

19. (new) The addition method of claim 14, wherein the polymer gel has a thermal decomposition temperature, that is, a heat-absorption peak temperature on a TG-DTA curve obtained when the polymer gel is heated at a rate of 5°C/min in a nitrogen gas flow, of not less than 300 °C.

20. (new) A method for manufacturing a hydroxyalkyl(meth)acrylate comprising the step of

activating (meth)acrylate with a polymer gel having a cyclic amine structure or a cyclic quaternary ammonium salt structure in the presence of an oxirane under conditions conducive to the addition of the oxirane to the (meth)acrylate to form a hydroxyalkyl(meth)acrylate.

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